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Swamy et al.

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[54] **DETACHABLE I/O DEVICE WITH BUILT-IN RF/IR FUNCTIONALITY TO FACILITATE REMOTE AUDIO-VISUAL PRESENTATION**

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[21] Appl. No.: **08/787,500**

[22] Filed: **Jan. 21, 1997**

[51] **Int. Cl.**[7] **G06F 3/033**

[52] **U.S. Cl.** **710/73**; 710/51

[58] **Field of Search** 384/14; 455/31.2, 455/66; 345/167, 179, 163, 520, 160, 169; 341/176; 710/73, 51; 382/313

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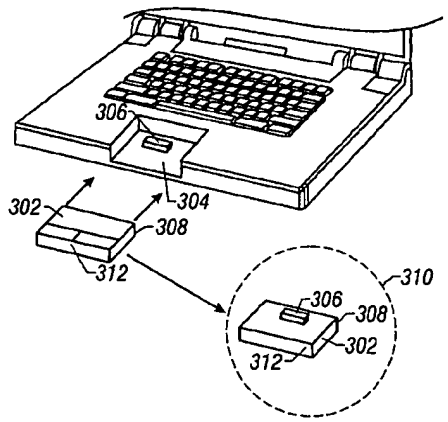
[57] **ABSTRACT**

A trackpad or other input/output device is detachable from a computer and adapted with a remote communication functionality using radio frequency (RF) or infrared (IR) technologies, thereby facilitating the performance of slide presentations and other graphic displays. A remote presentation capability allows a computer user to conveniently address a group from a position at a suitable location, such as a podium, that is removed from the computer system. A remote interface includes a trackpad or other input/output device and activation buttons. The input/output device is housed in a small removable enclosure which is adapted for docking into an aperture in the computer. The input/output device is rechargeable with a charger installed into the computer so that the input/output device is recharged during docking with the computer. A portable computer includes a removable input/output (I/O) device that functions as a conventional computer interface when docked to the portable computer and functions as a remote control for controlling operations of the portable computer when the I/O device is removed from the portable computer. The removable I/O device includes one or more activation buttons for usage in controlling operations such as the display operations of an audio-visual presentation. When the I/O device is removed from the portable computer, the I/O device communicates with the portable computer using a remote communication technique such as radio frequency (RF) or infrared (IR) remote communication techniques. The removable I/O device include rechargeable batteries that power the I/O device while the device is used remotely. The rechargeable batteries are charged by the portable computer when the I/O device is returned to the portable computer and docked to the portable computer.

33 Claims, 5 Drawing Sheets



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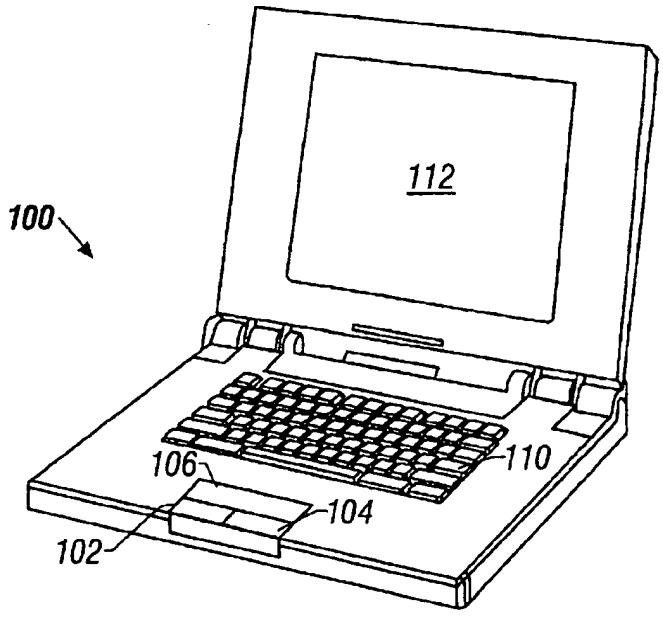

FIG. 1

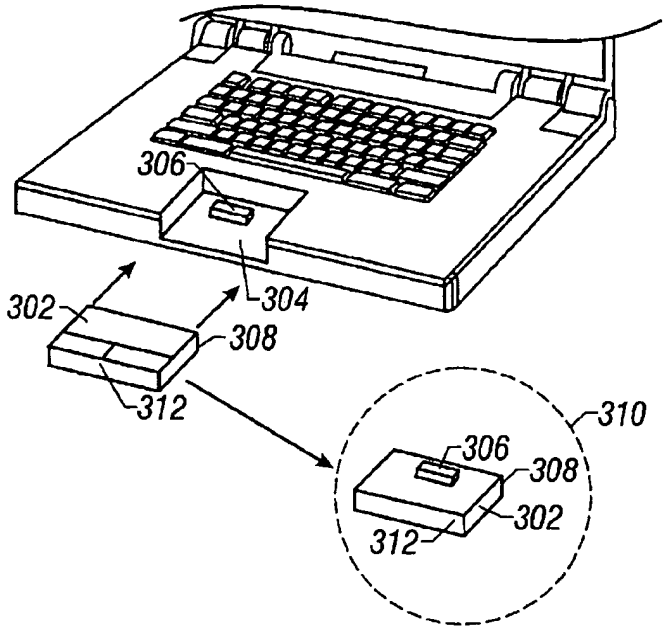

FIG. 3

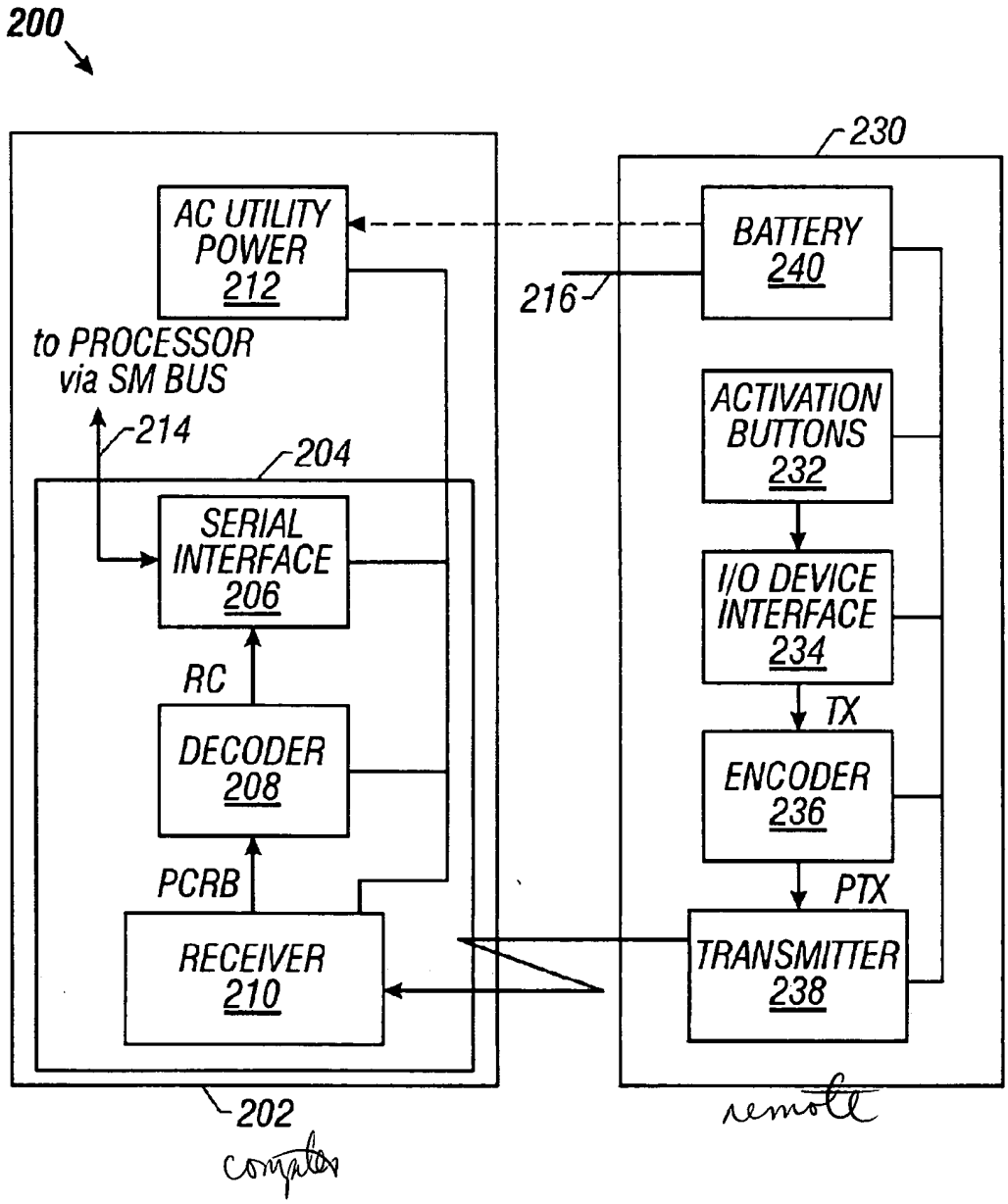
200
230
AC UTILITY POWER 212
BATTERY 240
216
to PROCESSOR via SM BUS
214
204
ACTIVATION BUTTONS 232
SERIAL INTERFACE 206
I/O DEVICE INTERFACE 234
RC
TX
DECODER 208
ENCODER 236
PCRB
PTX
RECEIVER 210
TRANSMITTER 238
202
computer
remote

FIG. 2

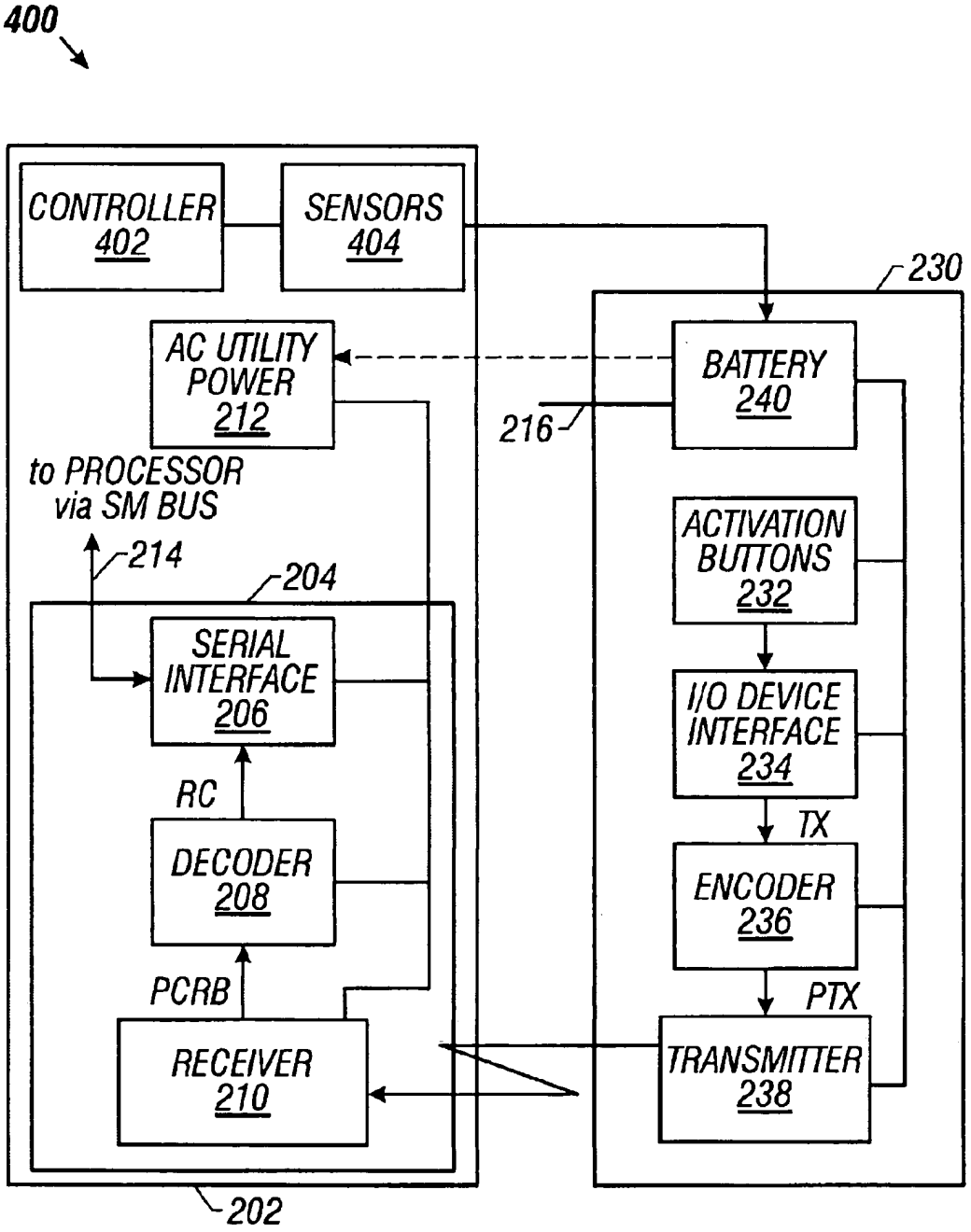
400
CONTROLLER 402
SENSORS 404
230
AC UTILITY POWER 212
BATTERY 240
216
to PROCESSOR via SM BUS
214
204
ACTIVATION BUTTONS 232
SERIAL INTERFACE 206
I/O DEVICE INTERFACE 234
RC
TX
DECODER 208
ENCODER 236
PCRB
PTX
RECEIVER 210
TRANSMITTER 238
202

FIG. 4

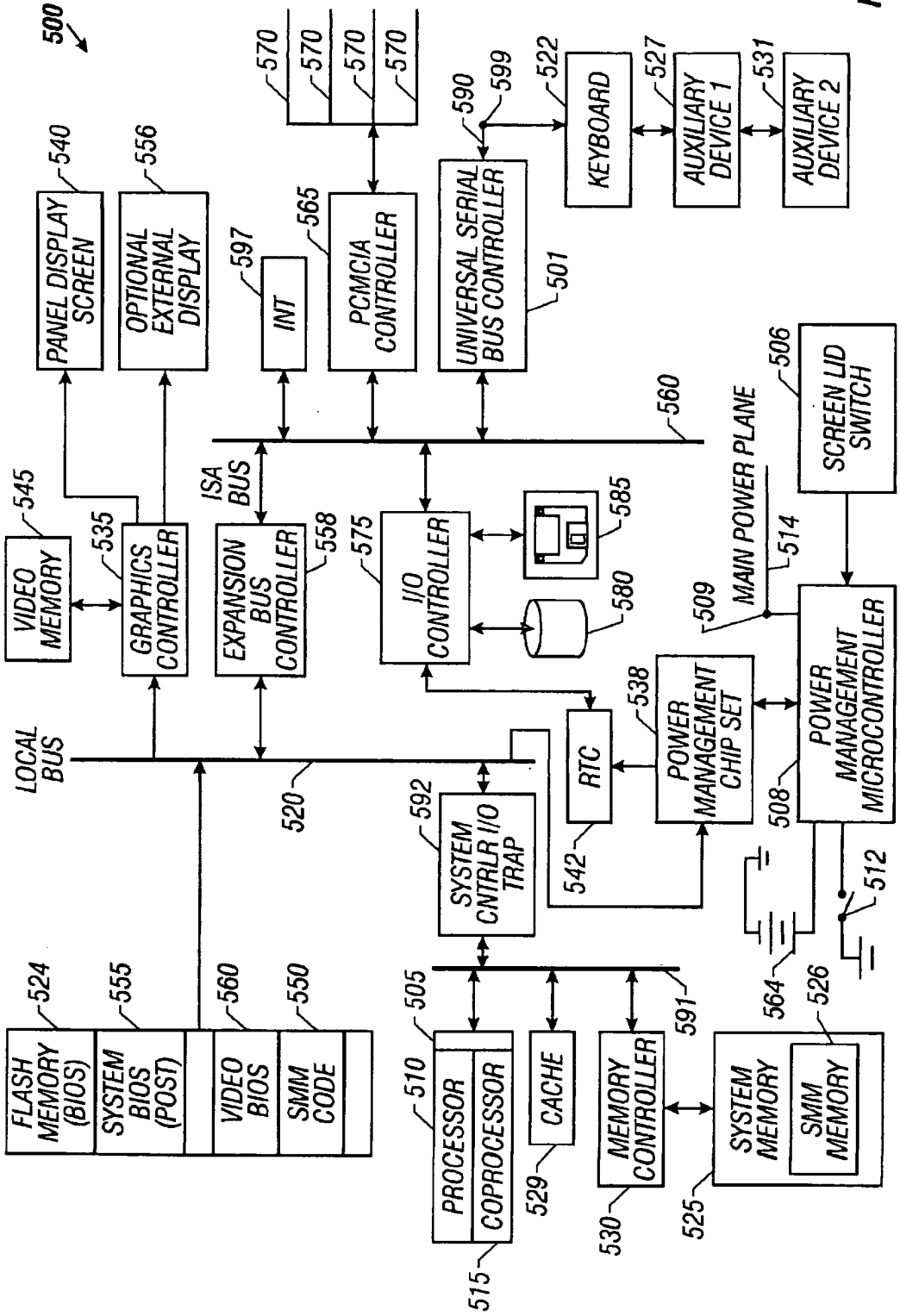
500
PANEL DISPLAY SCREEN
540
OPTIONAL EXTERNAL DISPLAY
556
570
570
570
570
INT
597
PCMCIA CONTROLLER
565
UNIVERSAL SERIAL BUS CONTROLLER
501
590
599
KEYBOARD
522
AUXILIARY DEVICE 1
527
AUXILIARY DEVICE 2
531
SCREEN LID SWITCH
506
MAIN POWER PLANE
514
509
560
ISA BUS
VIDEO MEMORY
545
GRAPHICS CONTROLLER
535
EXPANSION BUS CONTROLLER
558
I/O CONTROLLER
575
585
580
POWER MANAGEMENT CHIP SET
538
POWER MANAGEMENT MICROCONTROLLER
508
LOCAL BUS
520
RTC
542
SYSTEM CNTRLR I/O TRAP
592
512
564
526
FLASH MEMORY (BIOS)
524
SYSTEM BIOS (POST)
555
VIDEO BIOS
560
SMM CODE
550
505
591
PROCESSOR
510
COPROCESSOR
515
CACHE
529
MEMORY CONTROLLER
530
SYSTEM MEMORY
525
SMM MEMORY

FIG. 5

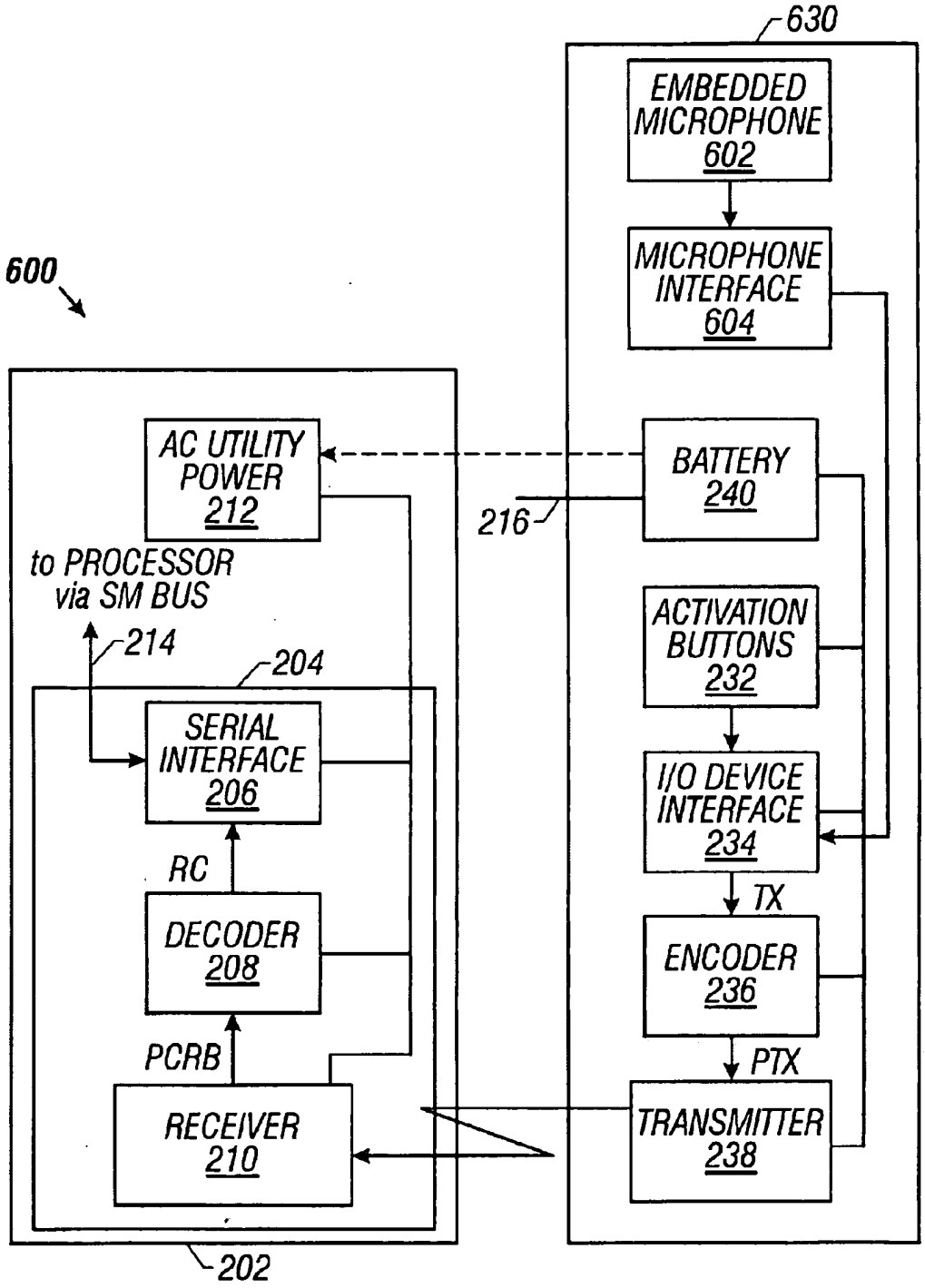
630
EMBEDDED MICROPHONE 602
MICROPHONE INTERFACE 604
600
AC UTILITY POWER 212
BATTERY 240
216
to PROCESSOR via SM BUS
214
204
ACTIVATION BUTTONS 232
SERIAL INTERFACE 206
I/O DEVICE INTERFACE 234
RC
TX
DECODER 208
ENCODER 236
PCRB
PTX
RECEIVER 210
TRANSMITTER 238
202

FIG. 6

DETACHABLE I/O DEVICE WITH BUILT-IN RF/IR FUNCTIONALITY TO FACILITATE REMOTE AUDIO-VISUAL PRESENTATION

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to computer systems. More specifically, the present invention relates to a computer system such as a portable or notebook computer system that includes a remote input device.

2. Description of the Related Art

Many software programs, such as PowerPoint in the Microsoft Office suite and Micrographx SlideShow, have been developed to facilitate the production of screen presentations. For example, PowerPoint allows a user to create slides, overhead transparencies, or printed presentations, and to display these visual aids simply by interactions on a computer.

The user controls the sequence of visual aid performance using either the keyboard or an input/output device attached to the computer, such as a mouse, a trackball, a trackpad, or other input/output device. The input/output device is connected to the computer so that a lone person performing a presentation is constrained to a location nearby the computer. A presenter and audience commonly are distracted and inconvenienced by the presenters need to leave a suitable position before the audience to press a key on the computer keyboard to advance the slide or screen display.

What is needed is a technique for controlling a computer from a remote position. What is needed is a technique for controlling a computer from a remote position to facilitate computer-generated or computer-displayed presentations.

SUMMARY OF THE INVENTION

In accordance with an embodiment of the present invention, a trackpad or other input/output device is detachable from a computer and adapted with a remote communication functionality using a wireless technology such as a radio frequency (RF) or infrared (IR) technology, thereby facilitating the performance of slide presentations and other graphic displays. A remote presentation capability allows a computer user to conveniently address a group from a position at a suitable location, such as a podium, that is removed from the computer system.

In accordance with an embodiment of the present invention, a remote interface includes a trackpad or other input/output device and activation buttons. The input/output device is housed in a small removable enclosure which is adapted for docking into an aperture in the computer. The input/output device is rechargeable with a charger installed into the computer so that the input/output device is recharged during docking with the computer.

In accordance with an embodiment of the present invention, a portable computer includes a removable input/output (I/O) device that functions as a conventional computer interface when docked to the portable computer and functions as a remote control for controlling operations of the portable computer when the I/O device is removed from the portable computer. The removable I/O device includes one or more activation buttons for usage in controlling operations such as the display operations of an audio-visual presentation. When the I/O device is removed from the portable computer, the I/O device communicates with the portable computer using a remote communication technique such as radio frequency (RF) or infrared (IR) remote communication techniques. The removable I/O device include rechargeable batteries that power the I/O device while the device is used remotely. The rechargeable batteries are charged by the portable computer when the I/O device is returned to the portable computer and docked to the portable computer.

Many advantages are achieved by the described detachable input/output device with built-in remote communication capabilities and operating method. A person presenting an audio-visual production is highly benefited by a capability to control a computer from a remote position. The described remote communication system and operating method advantageously supplies a cost-effective, portable, multimedia presentation apparatus.

BRIEF DESCRIPTION OF THE DRAWINGS

The features of the described embodiments believed to be novel are specifically set forth in the appended claims. However, embodiments of the invention relating to both structure and method of operation, may best be understood by referring to the following description and accompanying drawings. The use of the same reference symbols in different drawings indicates similar or identical items.

FIG. **1** is a pictorial frontal view showing a portable computer which includes a removable input/output device for entering data to the portable computer from a remote location.

FIG. **2** is a schematic block diagram which illustrates an embodiment of a remote I/O device communication system.

FIG. **3** is a pictorial view showing a modified track-pad or track-ball I/O device which interconnects to a main circuit board of a portable computer using a pair of board-to-board connectors.

FIG. **4** is a schematic block diagram illustrating an embodiment of a remote I/O device communication system which includes a controller and sensors connected to a battery for controlling the charging of the battery.

FIG. **5** is a block diagram showing a portable computer system which includes the remote I/O device communication system.

FIG. **6** is a schematic block diagram illustrating an embodiment of a remote I/O device communication system which includes an embedded microphone in a detachable I/O device to add a wireless microphone functionality.

DESCRIPTION OF THE ILLUSTRATIVE EMBODIMENT(S)

Referring to FIG. **1**, a pictorial frontal view shows a portable computer **100** which includes a removable input/output device **102** for entering data to the portable computer **100** from a remote location. The portable computer **100** includes standard input and output features such as a keyboard **110** and a display screen **112**. In the illustrative embodiment, the removable input/output device **102** is a trackpad input/output device having a capacitive connector **106** for sensing movement in X and Y directions and buttons **104** for pressing or releasing. Information concerning the amount and direction of motion in the X and Y directions and regarding the actuation of a button is passed to the portable computer **100** via a communication link (not shown). In some embodiments, the removable input/output device **102** is integrated into a portable computer **100** such as a notebook or laptop computer as a standard feature.

Referring to FIG. **2**, a schematic block diagram illustrates an embodiment of a remote I/O device communication

system **200**. A receiver subsystem **204** of the remote I/O device communication system **200** is connected as a peripheral device in a computer **202**, such as a notebook computer, portable computer, laptop computer, handheld computer or the like, for performing remote communications with a detachable input/output device **230**. The detachable input/output device **230** is a remote transmitter subsystem of the detachable input/output device **230** that operates in conjunction with the receiver subsystem **204** to supply remote communications from the detachable input/output device **230** to the computer **202**.

The receiver subsystem **204** of the remote I/O device communication system **200** includes a serial interface **206**, a decoder **208**, and a receiver **210**. The serial interface **206** is a conventional serial interface, such as a universal asynchronous receiver and transmitter (UART), a universal synchronous and asynchronous receiver and transmitter (USART), an asynchronous communications interface adapter (ACIA), a serial input/output (SIO), a multiple protocol communications controller, a serial communications controller, a data link controller, and the like. The serial interface **206** includes an internal programmable baud rate generator (not shown) for transmitting a serial bit stream at a programmable baud rate up to 115.2 Kbaud.

The detachable input/output device **230** of the remote I/O device communication system **200** includes a plurality of activation buttons **232**, an I/O device interface **234**, an encoder **236**, a transmitter **238**, and a rechargeable energy source such as a battery **240**, such as a small rechargeable battery cell. The activation buttons **232** are actuated by a user to generate signals applied to the I/O device interface **234**. The I/O device interface **234** converts the data to a serial bit stream format for transmission as a TX signal and passes the serial bit stream signal TX to the encoder **236**. The encoder **236** converts the serial bit stream signal TX into an electrical pulse form PTX and passes the electrical pulse signal PTX to the transmitter **238**. In various embodiments, the remote transmission signal may be an infrared (IR) signal or a radio frequency (RF) signal. The encoder **236** generates an electrical pulse signal PTX in which the time scale is compressed. In the example of an infrared (IR) signal, the transmitter **238** converts the electrical pulse signal PTX into optical infrared light pulses and transmits the infrared light pulses at a selected baud rate. The battery **240** is rechargeable and supplies operating power to the detachable input/output device **230** including the activation buttons **232**, the I/O device interface **234**, the encoder **236**, and the transmitter **238**. Typically, the configuration of the activation buttons **232** is selected to match the buttons and controls of standard I/O devices such as the button and mouse controls of mice, trackballs and track-pads.

The receiver subsystem **204** of the remote I/O device communication system **200** receives the communication signals generated by the detachable input/output device **230** at the receiver **210** and transforms the communication signals into received electrical pulses PRCB. In the example of an infrared remote I/O device communication system **200**, the receiver **210** detects infrared light pulses generated by another source transmitter and converts the light signal to electrical pulses. The receiver **210** passes the received electrical pulses PRCB to the decoder **208** which decodes the electrical pulses into a serial bit stream RC. The decoder **208** directs the serial bit stream RC to a serial input location of the serial interface **206** for communication to the computer. The receiver subsystem **204** is powered by the AC utility power **212** which supplies operating power to the computer **202** including the serial interface **202**, the decoder **208** and the receiver **210**.

In addition to supplying operating power to the receiver subsystem **204** of the computer **202**, the AC utility power **212** also supplies power to the detachable input/output device **230** by charging the battery **240** when the detachable input/output device **230** is attached to the computer **202**. The receiver subsystem **204** is connected to a smart management (SM) bus **214**. The smart management bus **214** is a standard bus for supplying connections to multiple various input/output devices including keyboard, mouse, trackpad, trackball, joystick connections and the like. The smart management bus **214** advantageously detects the presence, number, type and location of installed input/output devices so that present devices are selectively powered while devices that are not present or are deactivated are not supplied with power. A "device present" pin **216** is included on the detachable input/output device **230** to detect when the detachable input/output device **230** is connected to or detached from the computer **202**. When the device present pin **216** is indicative that the device is connected, the battery **240** is charged. In some embodiments, for example an embodiment shown in FIG. **4**, a remote I/O device communication system **400** includes a controller **402** and sensors **404** for connection to the battery **240** when the detachable input/output device **230** is attached to the computer **202** for determining the charge on the battery **240** and recharging the battery **240** only when the battery charge is within preselected limits.

In some embodiments, the detachable input/output device **230** is a modified version of standard track-pad or track-ball I/O devices. Referring to FIG. **3**, a modified track-pad or track-ball I/O device **302** interconnects to a main circuit board **304** of a portable computer **300** using a pair of board-to-board connectors **306**. The board-to-board connectors **306** are typically surface mount connectors, through-hole connectors or the like. Usage of board-to-board connectors **306** is advantageous in comparison to utilization of more conventional connectors such as a flex interconnect since board-to-board connectors **306** form a solid electromechanical connection while facilitating detachment, when desired. The modified track-pad or track-ball I/O device **302** has a leading edge **308** that forms a primary mechanical interlock **310**. When a trailing edge **312** of the modified track-pad or track-ball I/O device **302** is seated, the board-to-board connectors **306** are simultaneously mated to furnish a solid electromechanical interconnect. An inverted view **310** of the modified track-pad or track-ball I/O device **302** illustrates the board-to-board connectors **306** connected to the modified track-pad or track-ball I/O device **302**.

Referring to FIG. **5**, a portable computer system **500** includes a microprocessor **505** which may also be called a CPU. In some embodiments, the microprocessor **505** is, for example, an Intel™ Pentium class microprocessor or Intel™ 80486 class microprocessor. The microprocessor **505** has a processor **510** for calculating integer operations and a coprocessor **515** for calculating floating point operations. Microprocessor **505** is connected to a cache **529** and a memory controller **530** via a CPU bus **591**. The cache **529** may include both a primary cache (not shown) and a secondary cache (not shown).

A system controller I/O trap circuit **592** connects the CPU bus **591** to a local bus **520**. The system controller I/O trap circuit **592** is generally characterized as part of a system controller such as a Pico Power Vesuvious or an Intel™ Mobile Triton chip set. In some embodiments, the system controller I/O trap circuit **592** is programmed to intercept a particular target address or address range. Upon intercepting a target address, the system controller I/O trap circuit **592**

asserts an intercept signal indicating that the microprocessor **505** has attempted to access the target address.

In the some embodiments, the intercept signal is connected to an SMI ("system management interrupt") pin of the microprocessor **505**, causing the microprocessor **505** to enter system management mode ("SMM").

A main memory **525**, typically assembled from a plurality of dynamic random access memory ("DRAM") modules, is connected to the local bus **520** by a memory controller **530**. The main memory **525** includes a system management mode memory area which is employed to store converter code to implement conversion methodology embodiments as will be discussed in more detail subsequently.

A Basic Input Output System ("BIOS") memory **524** is connected to local bus **520**. A FLASH memory or other nonvolatile memory is used as BIOS memory **524**. BIOS memory **524** stores the system code which controls some operations of the portable computer system **500**.

A graphics controller **535** is connected to the local bus **520** and to a panel display screen **540**. The graphics controller **535** is also connected to a video memory **545** which stores information to be displayed on panel display **540**. The panel display **540** is typically an active matrix or passive matrix liquid crystal display ("LCD") although other display technologies may be used as well. Graphics controller **535** is optionally connected to an optional external display or standalone monitor display **556**. One example of a suitable graphics controller for usage as the graphics controller **535** is the Western Digital WD90C24A graphics controller.

A bus interface controller or expansion bus controller **558** connects the local bus **520** to an expansion bus **560**. In the illustrative embodiment, expansion bus **560** is an Industry Standard Architecture ("ISA") bus although other buses, for example, a Peripheral Component Interconnect ("PCI") bus, may otherwise be used. A PCMCIA "Personal Computer Memory Card International Association") controller **565** is connected to expansion bus **560**. The PCMCIA controller **565** is connected to a plurality of expansion slots **570** to receive PCMCIA expansion cards such as modems, fax cards, communications cards, and other input/output devices. An interrupt request generator **597** is also connected to the ISA bus **560** and issues an interrupt service request over a predetermined interrupt request line after receiving a request signal from the processor **505** requesting issuance of an interrupt

An I/O controller **575** is connected to ISA bus **560**. The I/O controller **575** is interfaced to both an integrated drive electronics ("IDE") hard drive **580** and a floppy diskette drive **585**.

A USB controller **501** transfers data to and from the processor **510** via the ISA bus **560**. A keyboard **522**, auxiliary device I, and auxiliary device II are connected serially to a USB connector **599**. This interconnection topology is implemented according the USB technology standard. External devices which include keyboard **522**, auxiliary device I, and auxiliary device II communicate with microprocessor **505** via the USB controller **501**. Auxiliary devices are typically communication devices such as a mouse, a modem, a joystick, or another computer system. When USB controller **501** receives data from the connected external devices, USB controller **501** issues an interrupt request to the microprocessor **505**. The microprocessor **505** interprets the interrupt request as a request for service from a conventional communication interface and attempts to process the interrupt request accordingly. However, a USB servicing routine is executed instead.

The portable computer system **500** includes a power supply **564**, such as a battery, which supplies operating power to the many devices of the portable computer system **500**. The power supply **564** in the portable computer system **500** is a rechargeable battery, such as a nickel metal hydride ("NiMH") or lithium ion battery. The power supply **564** is connected to a power management microcontroller **508** which operates in the manner of an AC line adapter and controls the distribution of power from power supply **564**. More specifically, the power control microcontroller **508** includes a power output terminal **509** connected to a main power plane **514** which supplies power to microprocessor **505**. The power management microcontroller **508** is also connected to a power plane (not shown) supplying operating power to panel display **540**. In the illustrative embodiment, the power control microcontroller **508** is a Motorola 6805 microcontroller. The power control microcontroller **508** monitors the charge level of the power supply **564** to determine when to charge a battery **564** and when to deny a charging voltage to the battery **564**. The power control microcontroller **508** is connected to a main power switch **512** which the user actuates to turn on or shut off the portable computer system **500**. While the power control microcontroller **508** powers down other portions of the portable computer system **500** such as hard drive **580** when not in use to conserve power, the power control microcontroller **508** itself is always connected to a source of energy, namely power supply **564**.

The portable computer system **500** also includes a screen lid switch **506** or indicator for indicating when the panel display **540** is in the open or closed positions. The panel display **540** is generally located in the typical lid location for "clamshell" types of portable computers such as laptop or notebook computers. The panel display **540** forms an integral part of the lid of the computer and is set in either an open position with the screen accessible for usage or a closed condition for storage and porting.

The portable computer system **500** also includes a power management chip set **538** which includes power management chip models PT86C521 and PT86C22 manufactured by Pico Power. The power management chip set **538** is connected to microprocessor **505** via local bus **520** so that the power management chip set **538** receives power control commands from microprocessor **505**. The power management chip set **538** is connected to a plurality of individual power planes supplying power to respective devices in the portable computer system **500** such as the hard drive **580** and floppy diskette drive **585**, for example. The power management chip set **538** operates under control of the microprocessor **505** to control the power to the various power planes and devices of the computer. A real time clock ("RTC") **540** is connected to the I/O controller **575** and the power management chip set **538** so that time events or alarms are transmitted to the power management chip set **538**. The real time clock **540** is typically programmed to generate an alarm signal at a predetermined time.

When the portable computer system **500** is turned on or powered up, the system BIOS software stored in nonvolatile BIOS memory **524** is copied into main memory **525** to execute instructions more quickly in a technique called "shadowing" or "shadow RAM". At this time, an SMM program code **550** is also copied into the system management mode memory area **526** of main memory **525**. The microprocessor **505** executes SMM code **550** after the microprocessor **505** receives a system management interrupt ("SMI") which causes the microprocessor to enter system management mode (SMM) operation. In addition to the

SMM code **550**, a video BIOS **562** and a system BIOS program code **555** including a power-on self-test (POST) module are stored in the BIOS memory **524** and copied into main memory **525** at power-up. Alternative memory mapping schemes may also be used. For example, SMM code **550** may be stored in fast SRAM memory (not shown) connected to the local/CPU bus **520**.

Referring to FIG. **6**, a remote I/O device communication system **600** includes an additional enhancement, in particular an embedded microphone **602** is added to the detachable input/output device **230**. The embedded microphone **602** is connected to a microphone interface **604** which converts signals from the embedded microphone **602** to a digital format for usage by the I/O device interface **234**. The I/O device interface **234** multiplexes the signals from the embedded microphone **602** with signals from the activation buttons **232**. The multiplexed signals from the embedded microphone **602** are communicated to the computer **202** via the transmitter **238** and the receiver **210**. The signals from the embedded microphone **602** are advantageously performed in multimedia systems using an audio generator (not shown) and speakers (not shown). The embedded microphone **602** advantageously adds a wireless microphone functionality in combination with the remote control features for enhancing the performance of audio/visual programs.

While the invention has been described with reference to various embodiments, it will be understood that these embodiments are illustrative and that the scope of the invention is not limited to them. Many variations, modifications, additions and improvements of the embodiments described are possible. For example, although the disclosed system is based on a portable computer, other types of computers such as desktops, computer-aided design (CAD) systems, computer-aided manufacturing (CAM) systems, workstations, and the like may also be used. In some embodiments these systems include a battery and AC line adapter.

What is claimed is:

1. A computer system comprising:

a computer housing enclosing a processor;

a docking station;

a detachable input/output (I/O) device that detachably docks to the docking station and functions (1) as a connected computer interface when docked to the docking station and (2) as a remote control for wirelessly communicating commands to the processor and controlling operations of the processor when detached from the docking station;

the docking station for the detachable I/O device adapted to receive wireless communication of commands from the detachable I/O device and transfer the received commands to the processor;

wherein the detachable I/O device includes a rechargeable battery, and is a detachable trackpad, trackball, or mouse I/O device;

wherein the computer system includes a charger for recharging the battery when the detachable I/O device is docked to the docking station;

wherein the detachable I/O device includes:

a microphone for generating audio signals; and

a multiplexer for multiplexing the audio signals with the commands, the detachable I/O device communicating the multiplexed audio signals and commands to the docking station; and

the docking station includes a demultiplexer for demultiplexing the audio signals from the commands for performance of the audio signals.

2. A computer system according to claim **1** wherein:

the detachable I/O device is a detachable trackpad or trackball I/O device including a plurality of activation buttons for generating commands for communication to the docking station and for controlling the processor.

3. A computer system according to claim **1** further comprising:

a serial interface coupling the detachable I/O device to the processor, the serial interface including:

direct serial connections coupling the detachable I/O device to the processor when the detachable I/O device is docked to the docking station; and

a wireless interface for communicating between the processor and the detachable I/O device when the detachable I/O device is detached from the computer housing.

4. A computer system according to claim **1** wherein:

the detachable I/O device and the docking station communicate by a radio frequency (RF) wireless communication technology.

5. A computer system according to claim **1** wherein:

the detachable I/O device and the docking station communicate by a infrared (IR) wireless communication technology.

6. A computer system according to claim **1** wherein:

the detachable I/O device includes:

a detachable enclosure;

a plurality of activation buttons enclosed within the enclosure;

an I/O interface coupled to the activation buttons and enclosed within the enclosure, the I/O interface for generating command signals based on actuation of the activation buttons;

an encoder coupled to the I/O interface for encoding the command signals; and

a transmitter coupled to the encoder and enclosed within the enclosure for transmitting the command signals; and

the docking station includes:

a receiver for receiving the transmitted command signals;

a decoder for decoding the command signals; and

a serial interface coupled to the decoder and coupled to the processor for transferring the commands from the decoder to the processor.

7. A computer system according to claim **1** further comprising:

a serial interface coupling the detachable I/O device to the processor, the serial interface including:

direct serial connections coupling the detachable I/O device to the processor when the detachable I/O device is docked to the docking station; and

a wireless interface for communicating between the processor and the detachable I/O device when the detachable I/O device is detached from the computer housing, the wireless interface having sufficient transmission and reception power to communicate a remote distance.

8. A computer system according to claim **1** wherein:

the detachable I/O device includes:

a detachable enclosure;

a plurality of activation buttons enclosed within the enclosure;

an I/O interface coupled to the activation buttons and enclosed within the enclosure, the I/O interface for generating command signals based on actuation of the activation buttons;

an encoder coupled to the I/O interface for encoding the command signals; and

a transmitter coupled to the encoder and enclosed within the enclosure for transmitting the command signals, the transmitter having sufficient power to transmit a remote distance; and

the docking station includes:

a receiver for receiving the transmitted command signals, the receiver having sufficient power to receive signals over a remote distance;

a decoder for decoding the command signals; and

a serial interface coupled to the decoder and coupled to the processor for transferring the commands from the decoder to the processor.

9. The computer system of claim **1**, where the I/O device is a trackpad.

10. The computer system of claim **1**, where the I/O device is a trackball.

11. The computer system of claim 1 further comprising:

a main circuit board;

wherein the detachable I/O device includes a first board-to-board connector;

wherein the docking station includes a second board-to-board connector fixably coupled to the main circuit board of the computer system;

wherein the detachable I/O device interconnects to the main circuit board of the computer system via the mating of the first board-to-board connector and the second board-to-board connector when the detachable I/O device is docked to the docking station.

12. An input interface for a computer system comprising:

a detachable input/output (I/O) device that functions as a conventional computer interface when docked to a computer and functions as a remote control for wirelessly communicating commands to the computer and controlling operations of the computer when detached from the computer; and

a docking station for the detachable I/O device for receiving wireless communication of commands from the detachable I/O device and transferring the received commands to the computer;

wherein the detachable I/O device includes a rechargeable battery, and is a detachable trackpad, trackball, or mouse I/O device; and

wherein the docking station includes a charger for recharging the battery when the detachable I/O device is docked to the docking station;

wherein the detachable I/O device includes:

a microphone for generating audio signals; and

a multiplexer for multiplexing the audio signals with the commands, the detachable I/O device communicating the multiplexed audio signals and commands to the docking station, and

the docking station includes a demultiplexer for demultiplexing the audio signals from the commands for performance of the audio signals.

13. A input interface according to claim **12** wherein:

the docking station includes:

a sensor for detecting when the detachable I/O device is docked to the computer; and

a controller for controlling the charger for recharging the battery when the detachable I/O device is connected to the computer.

14. A input interface according to claim **12** wherein:

the detachable I/O device includes:

a detachable enclosure;

a plurality of activation buttons enclosed within the enclosure;

an I/O interface coupled to the activation buttons and enclosed within the enclosure, the I/O interface for generating command signals based on actuation of the activation buttons;

an encoder coupled to the I/O interface for encoding the command signals;

a transmitter coupled to the encoder and enclosed within the enclosure for transmitting the command signals; and

a rechargeable battery cell for powering the activation buttons, I/O interface, encoder and transmitter; and

the docking station includes:

a receiver for receiving the transmitted command signals;

a decoder for decoding the command signals;

a serial interface coupled to the decoder and coupled to the computer for transferring the commands from the decoder to the computer; and

a charger for charging the battery of the detachable I/O device when the detachable I/O device is connected to the computer.

15. A input interface according to claim **12** wherein:

the detachable I/O device is a detachable trackpad or trackball I/O device including a plurality of activation buttons for generating commands for communication to the docking station and for controlling the computer.

16. A computer system comprising:

a computer including a processor;

a keyboard housing providing a keyboard and a docking station;

a detachable input/output (I/O) device that detachably docks to the docking station of the keyboard housing and functions (1) as a conventional computer interface when docked to the docking station and (2) as a remote control for wirelessly communicating commands to the computer and controlling operations of the computer when detached from the docking station, the detachable I/O device including a rechargeable battery for powering the detachable I/O device;

the docking station coupled to the processor and detachably coupled to the detachable I/O device adapted to receive wireless communication of commands from the detachable I/O device and transfer the received commands to the computer, the docking station including a charger for recharging the battery in the detachable I/O device when the detachable I/O device is docked to the docking station;

wherein the detachable I/O device includes:

a microphone for generating audio signals; and

a multiplexer for multiplexing the audio signals with the commands, the detachable I/O device communicating the multiplexed audio signals and commands to the docking station; and

wherein the docking station includes a demultiplexer for demultiplexing the audio signals from the commands for performance of the audio signals.

17. A computer system according to claim **16** wherein:

the detachable I/O device and the docking station communicate by a infrared (IR) wireless communication technology.

18. A computer system according to claim **16** wherein:

the docking station includes:

a sensor for detecting when the detachable I/O device is docked to the computer; and

a controller for controlling the charger for recharging the battery when the detachable I/O device is connected to the computer.

19. The computer system of claim **16** further comprising:

a main circuit board;

wherein the detachable I/O device includes a first board-to-board connector;

wherein the docking station includes a second board-to-board connector fixably coupled to the main circuit board of the computer system;

wherein the detachable I/O device interconnects to the main circuit board of the computer system via the mating of the first board-to-board connector and the second board-to-board connector when the detachable I/O device is docked to the docking station.

20. A computer system according to claim **16** wherein:

the detachable I/O device includes:

a detachable enclosure;

a plurality of activation buttons enclosed within the enclosure;

an I/O interface coupled to the activation buttons and enclosed within the enclosure, the I/O interface for generating command signals based on actuation of the activation buttons;

an encoder coupled to the I/O interface for encoding the command signals;

a transmitter coupled to the encoder and enclosed within the enclosure for transmitting the command signals; and

a rechargeable battery cell for powering the activation buttons, I/O interface, encoder and transmitter; and

the docking station includes:

a receiver for receiving the transmitted command signals;

a decoder for decoding the command signals;

a serial interface coupled to the decoder and coupled to the computer for transferring the commands from the decoder to the computer; and a charger for charging the battery of the detachable I/O device when the detachable I/O device is connected to the computer.

21. A computer system according to claim **16** wherein:

the detachable I/O device is a detachable trackpad or trackball I/O device including a plurality of activation buttons for generating commands for communication to the docking station and for controlling the computer.

22. A computer system according to claim **16** further comprising:

a serial interface coupling the detachable I/O device to the processor, the serial interface including:

direct serial connections coupling the detachable I/O device to the processor when the detachable I/O device is docked to the docking station; and

a wireless interface for communicating between the processor and the detachable I/O device when the detachable I/O device is detached from the computer housing.

23. The computer system of claim **16** wherein the computer system is a portable computer system and the keyboard housing houses the processor.

24. A computer system according to claim **16** wherein:

the detachable I/O device and the docking station communicate by a radio frequency (RF) wireless communication technology.

25. An audio/visual presentation device comprising:

a computer including a processor;

a docking station coupled to the computer;

a detachable input/output (I/O) device that detachably docks to the docking station and functions (1) as a conventional computer interface when docked to the computer and (2) as a remote control for wirelessly communicating commands to the computer and controlling operations of the computer when detached from the computer; and

the docking station coupled to the processor and detachably coupled to the detachable I/O device adapted to receive wireless communication of commands from the detachable I/O device and transfer the received commands to the computer;

wherein the detachable I/O device includes:

a microphone for generating audio signals;

a rechargeable battery for providing power to the detachable I/O device including the microphone; and

a multiplexer for multiplexing the audio signals with the commands, the detachable I/O device communicating the multiplexed audio signals and commands to the docking station;

wherein the docking station includes a demultiplexer for demultiplexing the audio signals from the commands for performance of the audio signals.

26. An audio/visual presentation device according to claim **25** wherein:

the docking station includes a charger for recharging the battery in the detachable I/O device when the detachable I/O device is docked to the computer.

27. An audio/visual presentation device according to claim **26** wherein:

the detachable I/O device includes:

a detachable enclosure;

a plurality of activation buttons enclosed within the enclosure;

an I/O interface coupled to the activation buttons and enclosed within the enclosure, the I/O interface for generating command signals based on actuation of the activation buttons;

an encoder coupled to the I/O interface for encoding the command signals;

a transmitter coupled to the encoder and enclosed within the enclosure for transmitting the command signals; and

a rechargeable battery cell for powering the activation buttons, I/O interface, encoder and transmitter; and

the docking station includes:

a receiver for receiving the transmitted command signals;

a decoder for decoding the command signals;

a serial interface coupled to the decoder and coupled to the computer for transferring the commands from the decoder to the computer; and a charger for charging the battery of the detachable I/O device when the detachable I/O device is connected to the computer.

28. An audio/visual presentation device according to claim **26** wherein:

the docking station includes:

a sensor for detecting when the detachable I/O device is docked to the computer; and

a controller for controlling the charger for recharging the battery when the detachable I/O device is connected to the computer.

29. An audio/visual presentation device according to claim **25** wherein:

the detachable I/O device and the docking station communicate by a radio frequency (RF) wireless communication technology.

30. An audio/visual presentation device according to claim **25** wherein:

the detachable I/O device and the docking station communicate by a infrared (IR) wireless communication technology.

31. An audio/visual presentation device according to claim **25** further comprising:

a serial interface coupling the detachable I/O device to the processor, the serial interface including:

direct serial connections coupling the detachable I/O device to the processor when the detachable I/O device is docked to the docking station; and

a wireless interface for communicating between the processor and the detachable I/O device when the detachable I/O device is detached from the computer housing.

32. An audio/visual presentation device according to claim **30** wherein the microphone is an embedded microphone.

33. An audio/visual presentation device according to claim **25** wherein:

the detachable I/O device is a detachable trackpad or trackball I/O device including a plurality of activation buttons for generating commands for communication to the docking station and for controlling the computer.

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